

Townsend (C. W.)

SUMMER DIARRHŒA

IN INFANTS:

Being an Analysis of the Cases Treated at the
Sea-Shore Home during the Summers
of 1887, 1888, and 1889.

BY
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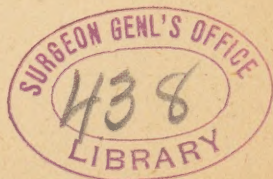
SUMMER DIARRHŒA IN INFANTS:

BEING AN

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THERE are no diseases occurring among infants whose treatment is more perplexing than that of the diarrhœal diseases which every summer play such havoc among the residents of large cities. The Sea-Shore Home at Winthrop receives from Boston during the summer months infants suffering from these diseases, and my endeavor in this paper will be to analyze the cases of the last three years, in order to arrive, if possible, at some conclusions as to methods of treatment. Although the number of cases is not large, my excuse for offering this report to your consideration is the fact that careful records were kept of each case, including daily record of weight, and thus my conclusions are obtained as much as possible from definite data, and not from general impressions which are apt to be so misleading. For these records I am greatly indebted to my house-officers, Dr. A. C. Stannard, Dr. A. S. Thayer, and Dr. E. J. Tilton, to whom I wish to express my thanks, and also to the sisters of St. Margaret, who have so intelligently conducted the nursing.

The diarrhœal diseases I have, for the sake of convenience, divided into three forms, which I shall define rather arbitrarily: first, cholera infantum, meaning by that an acute, probably specific, and general disease characterized by profuse watery purging and vomiting, and a high temperature, running a rapid course, and ending in death or recovery in from twenty-four to seventy-two hours. Second, gastro-intestinal catarrh, a disease characterized by vomiting and diarrhœa, the vomiting and stools often containing mucus. The temperature is either



normal or slightly elevated, and the disease lasts from a few days to months. Third, intestinal catarrh, in which the intestines are alone affected.

Let me here enter my protest against the loose way in which the term cholera infantum is used, even by physicians who know better, and let them not refer to intestinal catarrhs that have lasted for weeks as cases of this disease.

During the three summers there were 236 cases of diarrhoeal diseases at the Home, of which, 11, or four and a half per cent., were classed under the head of cholera infantum; 77, or thirty-two and a half per cent., were cases of gastro-intestinal catarrh; and 148, or sixty-two per cent., were cases of intestinal catarrh.

Cholera infantum (11 cases).—Of these, 7, or sixty-four per cent., died. Four died within eight hours of entrance, being admitted moribund. The duration, both in the fatal and non-fatal cases, was fifty-one hours, omitting one case, where active symptoms ceased on the second day, but where death ensued on the ninth day from gastro-intestinal catarrh and collapse. The temperature was recorded in five cases, reaching in all 105° F. or over, in one case 107° F.

The four cases that recovered began after an interval of one to four days to rapidly gain in weight; the average daily gain for five and one-third days for all these cases was found to be as much as ninety grammes (three ounces). This would serve to emphasize the fact that cholera infantum is a disease without appreciable local lesions; and although it may be followed by gastro-intestinal catarrh, which may prove fatal (as in the case noted above), it may, on the other hand, be promptly and entirely recovered from.

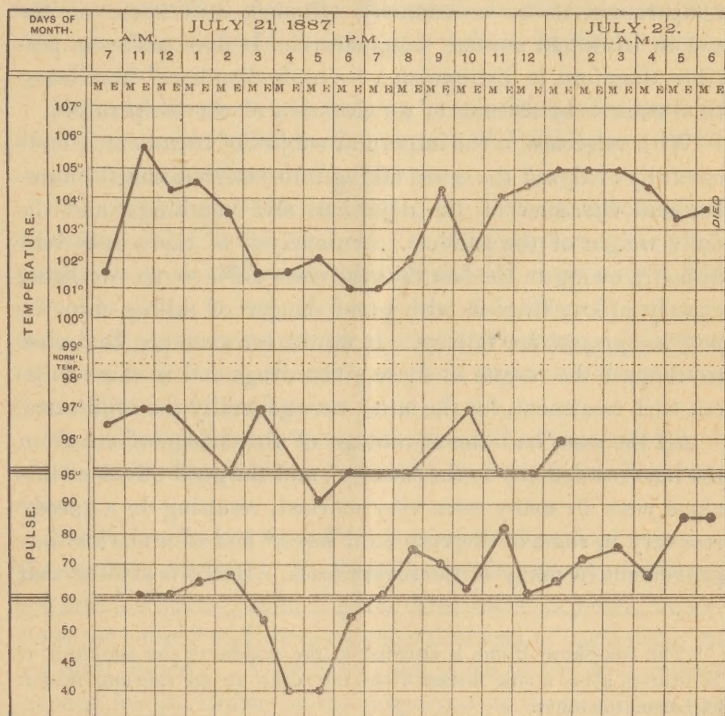
All of the fatal cases and two of those who recovered were on the bottle; the two others who recovered were partly nursed and partly fed artificially.

The average age of the cases was eight months; the extremes being three and twelve months for those that recovered, and one and a half and twenty months for those that died.

The treatment was essentially the same in all the cases, namely, brandy by the mouth in large and frequent doses, and occasionally subcutaneously; the application of warmth by

means of hot-water bottles to the extremities; of cold to the head, where this was indicated, and the administration of water in large quantities, to make up for the drain on the blood caused by the watery discharges. White of egg and beef-juice were also given as soon as they could be borne.

During the first summer, two cases of cholera infantum began at the Home, due unquestionably to the fact that the food was not sterilized. In the last two years the food has been sterilized, and since then no case has arisen at the Home. These two cases are very instructive. Both children had entirely recovered from intestinal catarrh, and were gaining weight on a diet of milk and barley-water; in both the attack was suddenly ushered in by profuse watery purging and vomiting, both went into a rapid collapse, had convulsions, and died in twenty-four hours. The hourly temperature chart of the child, aged twenty months, is here given.



Gastro-intestinal catarrh (77 cases)—*Intestinal catarrh* (148 cases).—Of the former, 37 were discharged well, 20 relieved, 14 not relieved, and 6 died. Of the latter, 121 were discharged well, 23 relieved, 4 not relieved, none died.

Observations on temperature.—In 79 cases temperature charts were kept, and out of 37 cases of gastro-intestinal catarrh, the temperature remained normal in 14; in 4 the temperature rose once or twice to 100° F.; in 7 it ranged from 99° to 100° for several days; and in 6 it occasionally went as high as 103°, returning to 99° or 98°.

Of 42 cases of intestinal-catarrh, the temperature remained normal in 28 cases; in 5 it occasionally rose to 100°; in 7 it continued for two or three days between 99° and 100°; and in 2 it rose once from normal to 103°. There was, in fact, no regularity in the temperature charts, as in cases of cholera infantum, and it was of but little value in prognosis. Although, as a rule, the sicker the case the more apt was the temperature to be occasionally elevated, still some of the sickest cases had normal temperature. It does not seem possible, therefore, to distinguish a "simple diarrhœa" from intestinal catarrh by absence of an elevation of the temperature.

With reference to the important subject of treatment, I have carefully analyzed the cases, taking into consideration the number and character of the dejections and vomitings, and the daily weight of the patients. An analysis of this sort is very difficult, owing to the fact that the cases differ so, no two being exactly alike; there is also great danger of falling into the *post hoc propter hoc* fallacy. It would, for example, be useless to compare the results in those given drugs and in those without such treatment, for the latter were generally the mild cases.

All the cases had the advantage of the change of air from the hot crowded city to the country; and the good effects of this alone were in many cases very marked, resulting in a speedy recovery in some of the very mild cases,* and in a marked improvement in many of the severe cases. But it is evident that

* The Sea-Shore Home is situated in the middle of the peninsula of Winthrop, about a mile distant from the ocean on one side and Boston harbor on the other.

a change in the air alone is not sufficient for the cure of any but the most transitory cases.

A change of diet was found to be the most important of all considerations, for in all some defect in the quality or quantity of the food given previous to entrance was found, the most marked defect being that the food was generally far from fresh or sterile, as was easily discovered by an examination of the bottles brought with the patients.

DIET.—During the second and third summers all the bottle-foods were systematically sterilized by steam, and the benefit obtained, as seen in the more favorable progress of the cases, was evident.

Breast-milk.—In 35 cases the infants were partly or wholly breast-fed. In 6 cases the breast-milk did not agree, in 29 cases it did agree, although in many of these the milk was evidently bad at first, as shown by the character of the stools and by the loss of weight in the infants; but later, as the mothers improved, with the change of air and diet and the freedom from household cares, the infants improved correspondingly.

Milk and lime-water, in varying proportions, were used in 39 cases. In 14 of these the mixture did not agree; in 25 improvement occurred during its use.

Milk and barley-water, in varying proportions, were used in 66 cases. In 17 it did not agree; in 49 improvement occurred during its use. Many of these were mild cases, and it was generally given to infants over a year old, where it was evident that the disease was of a transitory nature. Whether the same proportions of milk and plain water would not have done as well I do not know.

Peptonized milk was given in 11 cases, all rather severe, in 6 of which no improvement followed; in 5 there was improvement.

Modified milk mixture.—This, during the first summer, was the mixture of Dr. A. V. Meigs, consisting of cream (fifteen per cent.), 2 parts; milk, 1 part; lime-water, 2 parts; sugar-water (seventeen and three-quarters drachms of milk-sugar to the pint), 3 parts. After this it was given in the form recommended by Dr. Rotch, in the proportion of cream (fifteen per

cent.), 4 parts; milk, 2 parts; water, 9 parts; lime-water, 1 part; sugar of milk, $6\frac{3}{4}$ drachms to the pint of mixture. This latter mixture was variously modified to suit individual cases, by the reduction of the fat or of both fat and albuminoids. The mixture, in one form or other, was used in 75 cases, and, as a rule, in more severe cases than those in which milk and barley-water were given; 50 of these did well; 25 did not do well; but it was noticeable that the proportion of those with whom the mixture agreed increased in the last two years, owing partly to the fact that the food was sterilized and partly because the proportions of the food were differently arranged. I am, therefore, more and more satisfied with the use of this mixture, and can add that my results in private practice have been even more satisfactory. This difference is largely owing to the fact that, among the poorer class of patients, such as are taken to the Sea-Shore Home, many are to be found whose constitutions are so feeble that even with the best treatment they succumb to disease.

The only other forms of dietetic preparations used at the Home were beef-juice and white of egg in sterilized water. These were particularly useful in cases where vomiting was a prominent symptom; of 36 cases in which beef-juice was used, in 27 it acted well, in 9 it did not. The white-of-egg mixture was used in 23 cases, with good results in 16; without them in 7. Infants with severe gastro-intestinal catarrh were, as a rule, given beef-juice or that alternate with white-of-egg and water for twenty-four or forty-eight hours. At the end of this time the modified milk mixture was cautiously given in place of a few feedings of the beef-juice, was gradually increased, and the beef-juice diminished, until the latter was entirely replaced by the milk mixture. In a few cases the complete starvation plan was tried, of giving the baby water only for the first twenty-four hours, but it was not as successful as the above method, besides causing considerable anxiety and complaint on the part of the mothers.

Brandy was used in a large number of the cases, including all the severe ones.

DRUGS.—Eighty-seven cases were treated without drugs, reliance being placed on diet, the change of air, and good hy-

gienic measures; 76 of these cases did well, 11 did not improve. The mild cases are, as a rule, included in this list, also some of the serious cases. Treatment by drugs was limited, with a few exceptions, to bismuth, salicylate of soda, and lactic acid, belonging to the class of antiseptics, and these were, I think, given a thorough trial.

Bismuth was used in 42 cases. In 25 cases no improvement occurred during its use, as shown by the character of the stools or by the weight of the infant; in some of these its administration was objected to by the infant, with the result of causing vomiting. In 17 cases improvement occurred during its use. In either case, it is to be remembered that dietetic and hygienic measures were also employed.

Salicylate of soda was used in 26 cases, being given in water in doses of two grains every two hours to an infant of a year. In 14 cases there was no improvement; in 12 cases improvement occurred during its use.

Lactic acid was given in 12 cases, in doses of a drachm of the two-per-cent. solution, at intervals varying from a quarter-hour to two hours. No effect was noticed in 6 of these cases; in 5 improvement occurred under its use.

Resorcin was given in 4 cases, in 3 without effect, in 1 improvement occurred.

As the cases differed so in degree of severity and in duration before entrance, it is impossible to draw exact conclusions from these figures; but, taking into consideration the number of cases that did well without drugs, I am inclined to be rather sceptical as to the value of these antiseptics in the treatment of summer diarrhoea. Their use in my hands has certainly not been followed by the brilliant results reported by some. This difference can perhaps be explained by the fact that my cases remained constantly under observation, and were not of the uncertain out-patient class where favorable results are too often wrongly inferred from the non-reappearance of the patient and partly from the fact that zeal for a theory of intestinal antiseptics may have warped these reported judgments in deciding on the benefit obtained.

On theoretical grounds, if I am not mistaken, intestinal antiseptics by means of the drugs used at the present time is

impossible without danger to life, and with the late views on the function of certain intestinal bacteria it would, even if possible, be inadvisable.

Lavage of the large intestine with tepid water was used in 13 cases. In 10 of these, improvement was certainly marked, in 1 there was temporary improvement only, and in 2 no improvement took place. The results in these few cases encourage me to continue this treatment, although, as the small intestine is not reached by the washing, it does not seem to me that we should expect too much from this treatment alone. *Lavage* of the stomach I have not employed.

Relapses were not uncommon, and I have often wondered whether the patients might not be reinfected or their recovery delayed by the presence of so many others suffering from diarrhœal diseases. Infection through the food was prevented by the process of sterilization. There has been a steady improvement in the three years in the quarters given to the patients as regards space and ventilation, and with this an improvement in the progress of the cases.

Observations on weight.—A daily gain in weight is of course a most favorable indication. Some of the infants were discharged well in the course of one or two weeks, gaining in weight daily, yet weighing less than on entrance owing to the large initial loss before the diarrhœa was cured. The subsequent gain in weight was generally irregular, being often interrupted for a day or two. In a few cases there would be no gain in weight, notwithstanding the cure of the diarrhœa. Of 160 cases, there occurred a gain in weight over the lowest point reached in 105; 55 lost weight, and did not regain any. The average daily gain among the former cases was 38.8 grammes; the largest average gain for any one patient being 134 grammes (four and a half ounces) daily for eight days. The average daily loss in these 105 cases, until the lowest point was reached, was 34.8 grammes; the largest for any one patient being 255 grammes daily for two days. The average duration of the loss of weight was four and a half days. In other words, the average infant, after treatment was begun at the Home, lost weight at the rate of 35 grammes a day for four and a half days, and then began to gain at the rate of 39 grammes daily.

Thirty-four, or one-third, of the cases did not lose weight, but began to gain at once.

Of 49 cases that did not gain weight, the average daily loss was 40.6 grammes, the greatest being 130 grammes daily for four days. The average stay of these cases at the Home was ten days. It is probable that many of these would have soon begun to gain weight if they had stayed longer, as 18 were considered well, diarrhoea and vomiting having ceased, and the stools showed that the food was well digested.

Of 6 fatal cases, the average daily loss was 29 grammes, the average stay in the hospital being 11 days.

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